

REMARKS

After entry of the foregoing amendment, this application includes pending claims 9-26. Claims 1, 13, and 18 are amended, claims 1-8 are cancelled, and the remaining claims are unchanged. Reexamination and reconsideration of the application, as amended, are requested.

Claims 1-8 are cancelled and therefore the rejection of those claims under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 6,301,859 issued to Nakamura et al. (the "Nakamura Patent") is now moot. Claim 13 included a typographical error which is corrected for the foregoing amendment and now has the correct dependency. Its rejection under §102 is now overcome.

Claims 9-26 are rejected under 35 U.S.C. §103(a) as being unpatentable over the Nakamura Patent in view of U.S. Patent 4,896,048 issued to Boeckmann (the "Boeckmann Patent"). The Examiner describes the Nakamura Patent as disclosing the heat seal die described in Applicants' independent claims 9 and 18, but acknowledges that the Nakamura Patent does not disclose a form/fill/seal apparatus, a heat sealable material feeder, and a flowable material feeder. The Examiner cites the Boeckmann Patent as describing those features not disclosed in the Nakamura Patent and reasons that it would have been obvious to one of ordinary skill in the art, at the time Applicants' invention was made, to combine and modify the Nakamura Patent and the Boeckmann Patent teachings to provide a method and a system that include a heat sealable material feeder, flowable material feeder, and a form/fill/seal apparatus that is effective at producing air tight and leak proof packages. The Examiner acknowledges that neither the Nakamura Patent nor the Boeckmann Patent mention the size of the package being made, but the Examiner reasons that it would have been obvious to one of ordinary skill in the art at the time the invention was made to produce packages of portion size in the range desired. This rejection, as applied to amended independent claims 9 and 18, is respectfully traversed.

Independent claim 9 of this application describes a system for making portion control sized package flowable material. Independent claim 18 describes a corresponding method for making portion control sized package flowable material. The system of claim 9 describes a heat sealable material feeder, a flowable material feeder, and a form/fill/seal apparatus structured and arranged for making portion control sized packages. Specifically, this form/fill/seal apparatus is structured and arranged for receiving the heat sealable material, forming a portion control sized package with the heat sealable material, (filling the portion control sized package with the flowable material), and sealing the portion control sized package. The form/fill/seal apparatus includes a heat seal die comprising first and second heating elements and first and second longitudinal heat tubes disposed, respectively, in first and second die members. The heat tubes, which can also be described as heat pipes, are disposed between the heating element and the die face of each die member for maintaining a substantially uniform heat seal temperature along the die faces. As explained in Applicants' specification, heat tubes (heat pipes) typically comprise a closed metal tube, a wick disposed in the tube, and liquid disposed in the remaining volume of the tube. As the temperature along the heat tube changes, the fluid in the hotter area of the tube boils, picking up latent heat of vaporization. This high pressure travels to the lower pressure (cooler) area of the tube and condenses, thus transferring heat to the cooler area. This cycle in the heat tube equilibrates the temperature across the heat seal die members and keeps the temperature substantially uniform. See Specification, p. 3, ¶ 15.

Portion control sized form/fill/seal machines for making packages simultaneously seal the bottoms, and then the tops of several packages, as many as 12 packages at once. In this circumstance, uniform temperature, pressure, and dwell time across the flexible packaging material are critical. When sealing flexible packaging material to make portion control sized packaging, the two opposing faces of the flexible material must be heated to at least a

temperature at which the material softens, but not so high as to liquefy. The softened surfaces must be pressed together and maintained in intimate contact for a time sufficient to allow the entanglement of polymeric molecules across the interface separating the surfaces. As the sealed area cools, the entangled polymers effectively weld the two surfaces together, eliminating the previously separate surfaces and becoming a monolithic layer of material with thickness approximately equal to the sum of respective thickness of each of the two materials. This combination of pressure, temperature, and time of pressure application (dwell time) constitute the three basic variables used to control heat sealing processes.

In portion control packaging, narrow channel leaks can be formed when heat sealing flexible materials together to form the packages, particularly when the temperature along the length of the heat seal die is non-uniform such that the temperature in some areas falls below that required for adequate heat sealing. These narrow channel leaks can escape detection until after the portion control packages are packed and distributed in bags or cases. Channel leaks in portion control packages leak serum from the flowable material inside the packages and can contaminate the entire contents of bags or cases of portion control sized packages.

Figures 1 and 2, below, are graphic representations of temperature distribution across the top and bottom sealing bars on a type of portion control sized packaging machine called a multi-lane four-side seal pouch machine. Figures 1 illustrates a prior art machine and Figures 2 illustrates an embodiment of the present invention. During actual commercial production, the prior art machine shows a difference of 23 degrees F across the front sealing bar and a 31 degree F difference cross the back sealing bar. Such variation across the width of these seal bars can result in insufficient heating and sealing of the pouches. As can be seen in Figure 2, with an embodiment of the present invention, these differences drop to 8 and 4 degrees F, respectively.

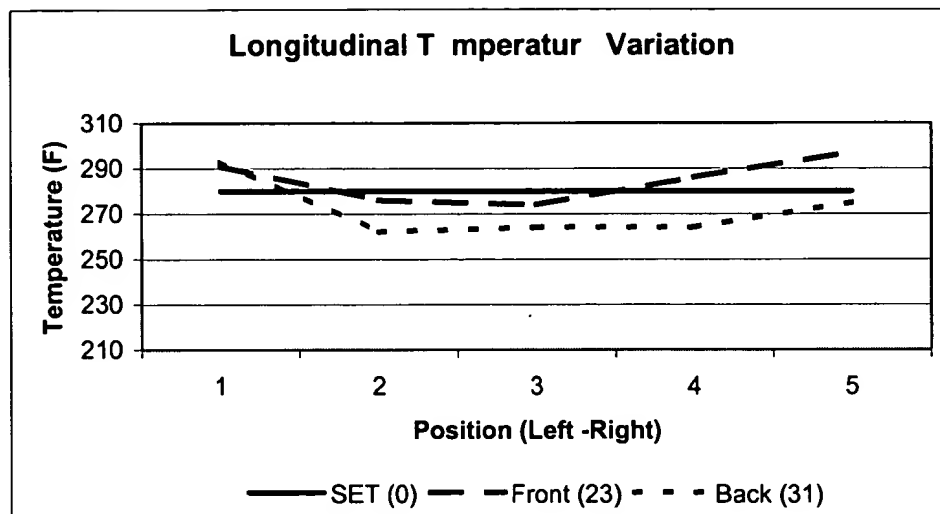


Figure 1: Operating Profile Without Invention

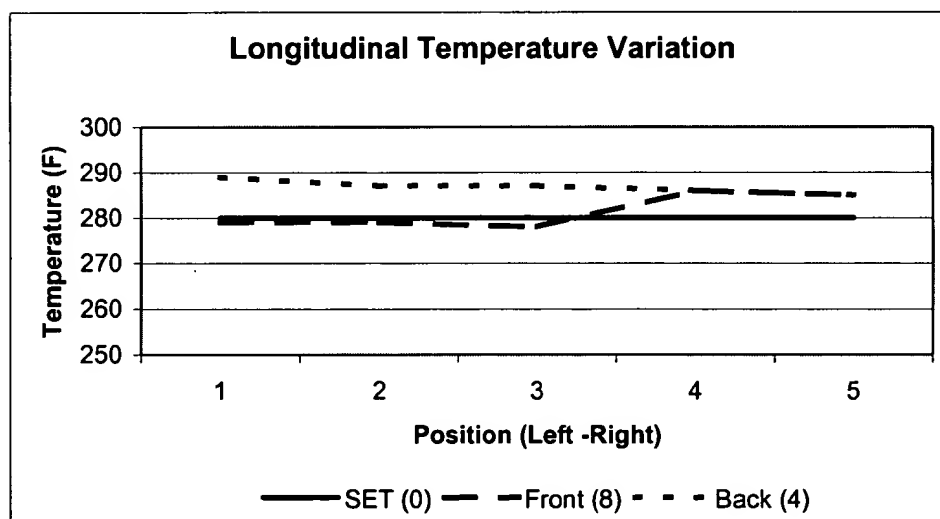


Figure 2: Operating Profile With Invention

See  
col. 2  
L 64-65

heat pipe

The Nakamura Patent, in contrast, discloses heat sealing jaws comprising heat conducting members 33a and 33b such as solid rods of copper having a high conductivity, instead of heat tubes or heat pipes as described in amended independent claims 9 and 18 of this application. Col. 8, l. 39-42. The heat seal jaws disclosed in the Nakamura Patent are not for portion control sized packaging as they are larger and include an integral cutter blade 30 and cutter groove 22 for simultaneously cutting flexible packaging upon heat sealing. Heat seal dies for portion control

sized packaging are not structured with an integral cutter blade because they are very thin in order to make the small portion controlled packages. Instead, the cutter blade in a portion control sized packaging system is separate from the heat seal die. The Nakamura Patent describes a concern with heat transfer through the depth of the heat seal dies from the heating element to the die face. The solution in the Nakamura Patent is to place the high conductivity solid copper rods between the heating elements and the die face of the heat sealing jaws.

The Nakamura Patent actually teaches that heat tubes (heat pipes) should not be used in the heat sealing dies, taking the position that heat tubes do not distribute heat adequately in the radial direction. Col. 9, l. 44 - col.10, l.27. The Boeckmann Patent does not relate to the use of heat tubes (heat pipes) or heat conducting members in heat sealing jaws, but rather, addresses the problem of package leaks by stretching the plastic film when heat sealing to reduce wrinkling. According to the Boeckmann Patent, reducing wrinkling of the film reduces leaks in the packaging.

According to M.P.E.P. §2142, three basic criteria must be met to establish a *prima facie* case obviousness. First, there must be some suggestion or modification, either in the references themselves or the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The teaching or suggestion to make the claim combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure. Cite *In re Vaeck*, 947 F.2d 488 20 U.S.P.Q. F.2d 1438 (Fed. Cir. 1991). Furthermore, prior art that teaches away from the claimed invention demonstrates a lack of *prima facie* obviousness. In re *Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986); In re *Fine*, 873 F.2d 1078, 5USPQ 2<sup>nd</sup> 1596 (Fed. Cir. 1988).

None of the three basic criteria of *prima facie* obviousness are met here and applicants respectfully submit that the Nakamura Patent and the Boeckmann Patent do not establish a *prima facie* case of obviousness against amended claim 9 and 18 of this application. First, there is no motivation to combine the Nakamura Patent and Boeckmann Patent, because the Nakamura Patent actually teaches away from using heat tubes, does not suggest using heat tubes in portion control sized packaging systems, and certainly does not appreciate the problems particular to the smaller, thinner portion control sized packaging heat seal dies. With portion control sized packaging heat seal dies, there is little concern about heat transfer through the depth of the dies, as they are small and thin. Instead, the concern is uniformity of temperature along the long length of the dies. This problem is well addressed by Applicants' invention as defined in independent claims 9 and 18 of this application, while the Nakamura Patent does not address portion control sized packaging system or this problem, and even teaches away from using heat tubes.

Furthermore, there would have been no reasonable expectation of success to one of ordinary skill in the art at the time the invention was made in view of the Nakamura Patent which clearly teaches not using heat tubes in heat seal dies. The Nakamura Patent describes heat tubes as inadequate in this application. Perhaps that is true for the heat dies described in the Nakamura Patent, but Applicants' have shown that it is very effective in heat seal dies for portion controlled packaging systems.

In addition, the combination of the Nakamura Patent and Boeckmann Patent does not result in the invention described in independent claims 9 and 18. The Boeckmann Patent solves heat seal packaging leaks by stretching the plastic film during heat sealing to reduce wrinkling. The Boeckmann Patent makes no reference to portion control sized packaging or equipment for making portion control sized packaging and does not suggest using heat tubes to solve the

problem addressed by Applicant's invention. Accordingly, the Boeckmann Patent does not add the shortcomings of the Nakamura Patent.

The criteria of prima facie of obviousness are therefore not met by the Nakamura Patent and the Boeckmann Patent. Accordingly, Applicant's respectfully submit that the rejection of Applicants' amended claims under the Nakamura and Boeckmann patents be removed.

A fourth factor that must be considered in evaluating nonobviousness is a number of "secondary considerations." *Graham v. John Deere*, 383 US1, 17, 86 Supreme Court 684, 694, 148 USPQ 459, 467 (1966); *Simmons Fastener Corp. v. Illinois Tool Works*, 739 F.2d 1573, 1575, 22 USPQ 744, 746 (Fed. Cir. 1984). Such secondary considerations include, but are not limited to, unexpectedness of the results of the claimed invention to those skilled in the art and a long felt but unsatisfied need for the claimed invention while the needed implementing arts and elements have long been available. *Graham v. John Deere* at 148 USPQ 467.

Applicants submit for consideration the unexpected results illustrated in Figure 2 hereinabove as evidence of nonobviousness. These results are particularly unexpected in view of the disclosure in the Nakamura Patent, which teaches that heat tubes are inadequate for controlling temperature in heat seal dies.

Reducing serum leakers in portion controlled packaging is a long felt but unsatisfied need in the packaging industry. Applicants submit herewith an excerpt from a publication entitled *Guidelines For Portion Control Packages*, published in 1999 by the Association for Dressings & Sauces. This association serves the market at which the invention described in the present application is directed. The guidelines generally indicate that serum leakers are considered a serious problem in the portion control packaging industry. See *Guidelines*, pages 132-137. The guidelines advise is as follows:

“Packaging films have changed dramatically over the last 20 years, yet serum leakers were there then and they are still here now. Studies have been done varying sealant materials and sealant thickness along with packaging machine conditions.”

See *Guidelines*, page 134.

The guidelines speculate that “gathering of the film and subsequent wrinkles may be the cause of most serum leakers.” See *Guidelines* page 132. The *Boeckmann* patent cited in the Office Action also focuses on wrinkles as the source of the problem. The guidelines suggest that portion control packaging machines must be maintained very diligently to minimize serum leakers. See *Guidelines*, page 134.

Furthermore, according to cited U.S. Patent 3,677,329 issued to *Kirkpatrick*, heat tubes have been available for over thirty years, but to Applicants’ knowledge, they have not been implemented in portion control sized packages heat seal dies until Applicants’ invention. This could be due to the prior understanding in the art that heat tubes will be unsuitable, as taught by the *Nakamura* Patent.

The long felt need for reducing serum leakers in portion control size packaging is finally satisfied by the invention described in the claims of the present application. The combination of the long felt need for reducing serum leakers and the concurrent availability of heat tubes and other endeavors establishes the nonobviousness of the system and method for portion control size packaging described in the independent claims of this application. Applicants respectfully submit that with this evidence of nonobviousness, the obviousness rejection based on *Nakamura* and *Boeckmann* is overcome.

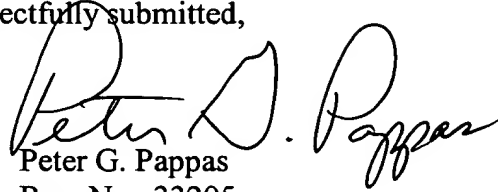
The foregoing is submitted as a full and complete response to the Office Action mailed December 31, 2002, and the allowance of all claims is respectfully requested. If there are any



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issues which can be resolved by a telephone conference or an Examiner's Amendment, the Examiner is invited to call the undersigned attorney at 404.853.8064.

Respectfully submitted,

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